In order to be successful in Honors Algebra II, you must have certain prerequisite skills mastered. You will be assessed on the content of this packet during the first week of school.

Please make your best effort as you work on this packet. You can work with another person, but keep in mind that each person has to take the quiz. Please show all of your work.

Enjoy your summer!! We look forward to meeting you and working with you when return to school in the fall.
Name: ________________________________

___ 1. Which graph correctly shows the real numbers \(-\sqrt{2}, -\frac{3}{4}, \) and \(-\pi\) on a number line?

A. 

\[ \begin{array}{cccccc}
& & & 0 & & \\
& & & 1 & & \\
-3 & -2 & -1 & 0 & 1 \\
\end{array} \]

B. 

\[ \begin{array}{cccccc}
& & & 0 & & \\
& & & 1 & & \\
-3 & -2 & -1 & 0 & 1 \\
\end{array} \]

C. 

\[ \begin{array}{cccccc}
& & & 0 & & \\
& & & 1 & & \\
-3 & -2 & -1 & 0 & 1 \\
\end{array} \]

D. 

\[ \begin{array}{cccccc}
& & & 0 & & \\
& & & 1 & & \\
-3 & -2 & -1 & 0 & 1 \\
\end{array} \]

___ 2. Identify the property shown.

\[(23 + 12) + 8 = 23 + (12 + 8)\]

A. distributive property
B. identity property of addition
C. associative property of multiplication
D. associative property of addition

___ 3. What is the value of \(w - (w + 2)^2\) when \(w = -5\)?

___ 4. It costs $3 for a used book at a library's sidewalk sale. Tenecia has $20. Which expression can be used to find how much money Tenecia would have left after buying \(b\) books at the sale?

A. \(20 + 3b\)  
B. \(3b - 20\)  
C. \(20 - 3b\)  
D. \(17b\)

___ 5. Which of the following shows the expression \(5(q - 3) + 2(4 - q)\) in simplified form?

A. \(3q + 5\)  
B. \(3q - 7\)  
C. \(4q + 5\)  
D. \(4q - 7\)

___ 6. What is the solution of \(8 + 5z = 2(3z - 7)\)?
7. Solve the equation \( \frac{3}{4} x + \frac{1}{2} = \frac{1}{4} (x - 2) \).

A. \(-2\)  
B. \(-\frac{1}{2}\)  
C. \(\frac{1}{2}\)  
D. \(2\)

8. Find the value of \( y \) in the equation \( 4x + 2y = 30 \) if \( x = 3 \).

A. \(5\)  
B. \(6\)  
C. \(9\)  
D. \(21\)

9. Strawberries and blueberries both cost \$1.50\ a pound. You bought 3 fewer pounds of blueberries than strawberries. If you spent \$10.50\ total, how many pounds of blueberries did you buy?

A. 1 pound  
B. 2 pounds  
C. 5 pounds  
D. 6 pounds

10. Consider the relation given by the ordered pairs \((-5, 0), (-1, -2), (4, -1), (6, -1), (-3, 2), (2, 0), \) and \((-6, -5)\). Which of the following statements is true?

A. The relation is a function because domain values are not equal to their range values.  
B. The relation is a function because each domain value maps to only one range value.  
C. The relation is not a function because there are range values that map to different domain values.  
D. The relation is not a function because the points do not lie on a straight line.

11. Evaluate the function \( h(x) = \frac{3}{4} x - 2 \) when \( x = 8 \).

A. \(4\)  
B. \(\frac{11}{2}\)  
C. \(8\)  
D. \(\frac{40}{3}\)

12. What function is shown in the graph?

A. \( f(x) = 3x - 3 \)  
B. \( f(x) = 3x + 3 \)  
C. \( f(x) = x - 3 \)  
D. \( f(x) = x + 3 \)

13. What is the slope of the line passing through the points \((-4, 3)\) and \((2, 5)\)?
14. A line passes through the points (4, 5) and (−8, 5). Which best describes the slope of the line?
   A. The slope is positive.  
   B. The slope is negative.  
   C. The slope is zero.  
   D. The slope is undefined.

15. The temperature at 6:00 A.M. was 45°F. At noon the temperature was 75°F. What was the average rate of change in temperature?
   A. −5°F/h  
   B. 5°F/h  
   C. 20°F/h  
   D. −20°F/h

16. What is the equation of a line with slope $\frac{7}{8}$ and y-intercept 28?
   A. $28y = −\frac{7}{8}x$  
   B. $y = 28x − \frac{7}{8}$  
   C. $y = \frac{7}{8}x + 28$  
   D. $\frac{7}{8}y = 28x$

17. Which two equations, when graphed, represent perpendicular lines?
   A. $y = 2x − 1$ and $y = 2x + 1$  
   B. $3x − 4y = 8$ and $y = −\frac{4}{3}x + 2$  
   C. $x + 2y = 5$ and $2x + y = 3$  
   D. $y = −3x + 3$ and $3x + y = 10$

18. Write an equation for the line that passes through the points (0, −3) and (−2, 1).

19. How many solutions does the linear system have?
   $8x − 2y = 6$
   $−4x + y = 2$
   A. none  
   B. exactly one  
   C. exactly two  
   D. infinitely many

20. Which ordered pair is a solution to the system?
   $−5x + 2y = 17$
   $3x − y = −10$
   A. (−3, 1)  
   B. (1, 13)  
   C. (1, 1)  
   D. (3, 16)

21. Solve the system using substitution.
   $3x − 4y = −25$
   $−2x + y = 10$
   A. (3, −8)  
   B. (5, −4)  
   C. (−3, 4)  
   D. (−11, 36)
22. Solve the system using the linear combo method.

\[6x + 5y = 2\]
\[3x + 4y = 7\]

A. (1, 1)  B. (-3, 4)  C. (4, -1)  D. (9, -5)

23. What is the solution to the inequality \(6 + 2h > h - 7\)?

A. \(h > -8\)  B. \(h > -4\)  C. \(h > 4\)  D. \(h > 8\)

24. What solution is graphed on the number line?

\[\text{Number line image}\]

A. \(-3 \leq x < 2\)  B. \(-3 < x \leq 2\)  C. \(-3 < x < 2\)  D. \(-3 \leq x < 2\) or

25. Which ordered pair is a solution of \(5x - 2y > 6\)?

A. (0, -2)  B. (2, -3)  C. (-1, -1)  D. (2, 2)

26. Which inequality is shown in the graph?

\[\text{Graph image}\]

A. \(y \geq -\frac{2}{3}x - 1\)  B. \(y > -\frac{2}{3}x - 1\)  C. \(y < -\frac{2}{3}x - 1\)  D. \(y \leq -\frac{2}{3}x - 1\)

27. The ordered pair (-2, 4) is a solution to which system of linear inequalities?

A. \(y > x + 2\) \(y \geq -2x + 1\)  B. \(y > 2x + 1\) \(y < -x + 3\)  C. \(y \leq 2x + 5\) \(y \leq -3x\)  D. \(y \geq -2x\) \(y > -x + 6\)
28. Which system of linear inequalities is shown in the graph?

A. \( x \geq 3 \quad y < x + 2 \quad y > \frac{x}{4} \)

B. \( x \leq 3 \quad y > x + 2 \quad y < \frac{x}{4} \)

C. \( x \leq 3 \quad y < x + 2 \quad y < \frac{x}{4} \)

D. \( x \leq 3 \quad y < x + 2 \quad y > \frac{x}{4} \)

29. What is the solution of the absolute value inequality \(|2x + 5| > 25|\)?

A. \( x > 10 \) or \( x < -15 \)

B. \( x > 10 \) or \( x > -15 \)

C. \( x < 10 \) or \( x > -15 \)

D. \( x < 10 \) or \( x < -15 \)

30. What is the value of \( f(x) = 2|x + 4| - 1 \) when \( x = -6? \)

31. What is the correct factorization of \( x^2 + 3x - 10? \)

32. What is the factored form of the expression \( g^2 - 4? \)

33. What is the correct factorization of \( 9x^2 + 12x + 4? \)

A. \( (3x - 2)^2 \)

B. \( (3x + 2)(3x - 2) \)

C. \( (3x + 2)^2 \)

D. \( 3x + 2 \)

34. What is the solution of \( x^2 - 16x + 64 = 0? \)

A. \(-16\)

B. \(-8\)

C. \(8\)

D. \(64\)

35. What is the value of \( \left( \frac{3^2}{3^2} \right)^{-1} \)?

A. \(0\)

B. \(\frac{1}{81}\)

C. \(3\)

D. \(81\)
36. Which function has a leading coefficient of $-3$ and degree 5?
   A. $f(x) = 5x^3 + 2x^2 - 6x + 18$
   B. $f(x) = -3x^5 + 2x^3 + 6x - 18$
   C. $f(x) = -3x^3 + 5$
   D. $f(x) = 5x - 3$

37. What is the simplified form of the expression $(6x^3 + 2x - 7) + (8x^2 - 4x + 12)$?

38. Simplify the expression $3x(x^2 + 2x - 4) - 2(x^3 - 8)$.

39. Find the product $(2x - 1)(7x^2 + 3x - 5)$.

40. Find the product $(2a - 5b)^2$.

41. What is the solution of $-4x^3 = 32$?
   A. $-8$
   B. $-2$
   C. $2$
   D. $2\sqrt{2}$

42. Solve $4\sqrt{5x + 6} = 24$.
   A. 0
   B. 6
   C. 36
   D. 114

43. What is \( \frac{f(x)}{g(x)} \) if \( f(x) = x^2 + x - 12 \) and \( g(x) = x - 3 \)?
   A. \( x + 4 \)
   B. \( \frac{(x - 4)(x + 3)}{x - 3} \)
   C. \(-4\)
   D. \( x - 4 \)

44. Simplify the expression \( \frac{3x^2 + 21x + 36}{6x + 24} \).

45. Multiply: \( \frac{x^2 - 9}{x + 3} \cdot \frac{x - 5}{x^3 + 2x - 15} \).

46. Divide: \( \frac{9x^2 + 18x - 72}{x^2 - 4x + 4} \div \frac{3x^2 + 15x + 12}{x^2 - 3x + 2} \).

47. Solve \( \frac{8}{x + 1} = \frac{15}{2x + 1} \).
48. A city wants to know if they should open a new skateboard park. Which chosen sample is least likely to be biased?

A. 100 randomly selected customers at a skateboard shop
B. 40 randomly selected teenagers from the local high school
C. 10 randomly selected homeowners near where the park would be built
D. 90 randomly selected households from across the city

49. In a health club with 900 members, a survey of 50 members found that 18 would like to see a yoga class offered. Predict how many members of the health club would like a yoga class offered.

A. 18  B. 324  C. 450  D. 2500

50. Find the mean, median, and range of the new data set if each entry of the given data set is multiplied by 5.

23, 11, 7, 14, 8, 19, 3, 11

51. You have a bag of 16 red, 6 white, and 10 blue beads. What is the probability of randomly choosing a white bead from the bag?

A. \( \frac{1}{2} \)  B. \( \frac{13}{16} \)  C. \( \frac{5}{16} \)  D. \( \frac{3}{16} \)

52. What is the next term in the sequence 6, 13, 20, 27, \ldots ?

Graph the numbers on a number line. Then write the numbers in order from least to greatest.

53. \(-0.6, \frac{7}{10}, -3, -\frac{5}{2}, 4\)

54. \(\frac{3}{2}, ?, \sqrt{3}, -2, 0.7\)

Identify the property shown.

55. \(3 + 2 = 2 + 3\)

Simplify the expression.

56. \(4(2x + 3) - x\)

57. \(4(y - 2) + 2(y + 3)\)
58. \(3^3 - 3(6 - 2^2)\)

Solve the equation.

59. \(x - 4 = 20\)

60. \(3m + 1 = 7m - 11\)

In Exercises 5–6, use the following data set.
27, 31, 23, 14, 18, 20, 24, 32, 19, 24, 21

61. Find the mean.

62. Find the mode(s) and range.

63. Draw a box-and-whisker plot for the following data set.
167, 154, 167, 142, 138, 186, 173, 175, 167, 185, 158, 169, 181

In Exercises 8–9, use the following data set.
38, 42, 53, 58, 67, 67, 69

64. Make a frequency distribution of the data. Use four intervals beginning with the interval 31–40.

<table>
<thead>
<tr>
<th>Interval</th>
<th>Tally</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>31–40</td>
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65. Draw a histogram of the data set.